



A REVIEW ON BLOCKCHAIN TECHNOLOGY

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ABSTRACT

Blockchain is the backbone Technology of Digital Cryptocurrency Bitcoins. The blockchain is a distributed database of records of all transactions or digital event that have been executed and shared among participating parties. Each transaction verified by the majority of participants of the system. It contains every single record of each transaction.

Intensive research is currently being conducted in both academia and industry applying the Blockchain technology in multifarious applications. Proof-of-Work, a cryptographic puzzle, plays a vital role in ensuring Blockchain security by maintaining a digital ledger of transactions, which is considered to be incorruptible. This paper gives details about Blockchain its need which is followed by features, types and applications of blockchain.

KEYWORDS: Blockchain, Need, Types, Features, Applications.

INTRODUCTION:

What is Blockchain?

Blockchain is an emerging technology platform for developing decentralized applications and data storage, over and beyond its role as the technology underlying the cryptocurrencies. The basic tenet of this platform is that it allows one to create a distributed and replicated ledger of events, transactions, and data generated through various IT processes with strong cryptographic guarantees of tamper resistance, immutability, and verifiability. Public blockchain platforms allow us to guarantee these properties with overwhelming probabilities even when untrusted users are participants of distributed applications with ability to transact on the platform. Even though, blockchain technology has become popularly known because of its use in the implementation of Cryptocurrencies such as Bitcoin, Ethereum, etc., the technology itself holds much more promise in various areas such as time stamping, logging of critical events in a system, recording of transactions, trustworthy e-governance etc.

NEED OF BLOCKCHAIN TECHNOLOGY:

The most basic need of blockchain is to carry out transactions or exchange of information through a secure network. But the way people use blockchain and distributed ledger technology or network vary from case to case. For instance, if we talk about Bitcoin, which is how blockchain got introduced in the mainstream. Bitcoin is a digital cryptocurrency which gets transacted through the blockchain and DLT technologies. This type of blockchain network is a public network because people from all over the world can become a node, verify other node and trade bitcoins. On the other hand, let us suppose that a bank is using a private blockchain network. It will be a restricted network where only the authorized members of the bank can access confidential information. Thus, no one out of this closed network can gain access to bank data. A private network will have limited and authorized nodes monitored by a network administrator. The information transmitted through such a private blockchain network stays within the network. Any new node that wishes to get added in a private network needs permission from the network admin. The bank gets to decide the scale of their private blockchain for all the branches of a city or all their branches in a country. Just like these examples, there are different ways in which the blockchain network is set up depending on the use and requirements.

TYPES OF BLOCKCHAIN:

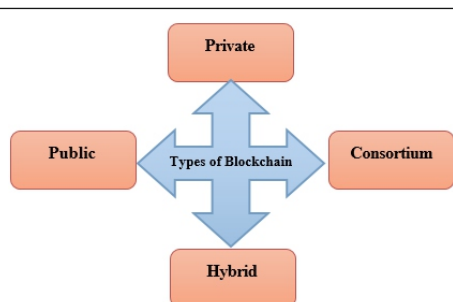


Figure 1: Types of Blockchain

1. Public Blockchain:

A public blockchain is a non-restrictive, permission-less distributed ledger system. Anyone who has access to the internet can sign in on a blockchain platform to become an authorized node and be a part of the blockchain network. A node or user which is a part of the public blockchain is authorized to access current and past records, verify transactions or do proof-of-work for an incoming block, and do mining. The most basic use of public blockchains is for mining and exchanging cryptocurrencies. Thus, the most common public blockchains are Bitcoin and Litecoin blockchains. Public blockchains are mostly secure if the users strictly follow security rules and methods. However, it is only risky when the participants don't follow the security protocols sincerely.

2. Private Blockchain:

A private blockchain is a restrictive or permission blockchain operative only in a closed network. Private blockchains are usually used within an organization or enterprises where only selected members are participants of a blockchain network. The level of security, authorizations, permissions, accessibility is in the hands of the controlling organization. Thus, private blockchains are similar in use as a public blockchain but have a small and restrictive network. Private blockchain networks are deployed for voting, supply chain management, digital identity, asset ownership, etc.

3. Consortium Blockchain:

A consortium blockchain is a semi-decentralized type where more than one organization manages a blockchain network. This is contrary to what we saw in a private blockchain, which is managed by only a single organization. More than one organization can act as a node in this type of blockchain and exchange information or do mining. Consortium blockchains are typically used by banks, government organizations, etc.

4. Hybrid Blockchain:

A hybrid blockchain is a combination of the private and public blockchain. It uses the features of both types of blockchains that is one can have a private permission-based system as well as a public permission-less system. With such a hybrid network, users can control who gets access to which data stored in the blockchain. Only a selected section of data or records from the blockchain can be allowed to go public keeping the rest as confidential in the private network. The hybrid system of blockchain is flexible so that users can easily join a private blockchain with multiple public blockchains. A transaction in a private network of a hybrid blockchain is usually verified within that network. But users can also release it in the public blockchain to get verified. The public blockchains increase the hashing and involve more nodes for verification. This enhances the security and transparency of the blockchain network.

FEATURES OF BLOCKCHAIN:

1. Peer-to-peer cash:

Blockchain caught popularity when the famous Bitcoin whitepaper, written by Satoshi Nakamoto, was released in October 2008. It describes a purely peer-to-peer system allowing money to be sent directly from one party to another without going through a central authority such as a financial institution.

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The concern revolves around sending electronic cash from one person to another. This is the current system with banks. Banks are updating and maintaining at least two databases, each of which need to be constantly updated. (Double-entry accounting)

Suppose I deposit \$1,000 in my bank account. They update the database and it points to a record that I have \$1,000. Let's say I want to send \$10 to Ann Marie. Take \$10 from my account and record \$10 in Ann Marie's account. Those separate databases must synchronize in order for the \$10 to leave my account and enter Ann Marie's.

There is an inherent weakness in the trust model, which is the need for a middleman. I can't send it to you directly without this bank in the middle. With the Bitcoin block chain, I can.

2. Double Spend Problem:

Unlike when we take a picture with our phone and send it to a friend, I still have a copy of that picture. Obviously, with money, you can't do that. A person who spends money can no longer have possession of that money. This creates what we call the "double spend problem." The Bitcoin network, for the first time, solves that double spend problem with the middleman. It does this by using math and computational power. That is the innovation.

3. Increased Capacity:

This is the first and an important feature of Blockchain. The most remarkable thing about this Blockchain technology is that it increases the capacity of the whole network. Because of the reason that there are a lot of computers working together which in total offers a great power then few of the devices where the things are centralized.

A perfect example of this increased capacity is a project started by Stanford University which created a supercomputer that simulates protein folding for medical research.

4. Better Security:

Blockchain technology has a better security because there is not even a single chance of shutting down of the system. Even the highest level of the financial system are subject to get hacked. Bitcoin in the second hand had never been hacked. The reason is that the blockchain network is secured by a number of computers called nodes and these nodes confirm the transaction on this network.

5. Immutability:

Creating immutable ledgers is one of the main values of Blockchain. Any database that is centralized is subjected to get hacked and they require trust in the third party to keep the database secure. Blockchain like Bitcoin keeps its ledgers in a never-ending state of forwarding momentum.

To control the Bitcoin market anyone needs control over 51% of the total market. Although we can change ledgers by Hard Fork it needs a general agreement amongst miners, exchange, and individual users, node operators. But still, there are high chances that the old ledgers would remain in their real form.

6. Faster Settlement:

Traditional banking systems can be slow, as they require a lot of settlement time which usually takes days to proceed. This is one of the main reason why these banking institutes need to upgrade their banking systems. We can solve this problem by the means of Blockchain as it can settle money transfer at really fast speeds. This ultimately saves a lot of time and money from these institutions and provide convenience to the consumer also.

7. Decentralized System:

Decentralized technology gives you the power to store your assets in a network which further access by the means of the internet, an asset can be anything like a contract, a document etc. Through this owner has a direct control over his account by the means of a key that is linked to his account which gives the owner a power to transfer his assets to anyone he wants.

The Blockchain technology proves to be a really effective tool for decentralizing the web. It does possess the power to bring massive changes in the industries.

8. Minting:

Basically, there are a lot of ways of minting a problem of manipulation that we can solve by Blockchain. If you go to the west and ask them do they trust technology there answer would be yes namely Google, Facebook or their banks but this is not the case with the other world, they do not trust these organization that much. It's not about the places, those are rich.

APPLICATION OF BLOCKCHAIN TECHNOLOGY:

1. Crowdfunding with Trust:

Today crowdfunding has an accountability problem. Why? As many as 85% delay delivery while 14% fail to deliver what was promised. So what happens if you give money to the wrong campaign and someone misuses the money? You may never want to support a tech project again. With blockchain technology, you know more information. Like who you're going to send money to and how the creators spend the money. On the other hand, creators will receive more support for their projects with lower fees and overall cost, without hefty fees from lawyers.

It's just like buying a house, and you don't give all the money upfront. You hold some money in escrow. Only when the estate developer builds the house for you, a portion of funds is released. Likewise, crowdfunding money will not be released with the help of a smart contract until the creator is making progress on the project. So you have trust.

2. Transfer Money Internationally:

What do you do when you need to transfer small amounts internationally? You probably use a transfer service like Western Union. This trusted middleman transfers money between its offices worldwide. Finally, balances its accounts on the backend, using international bank transfers. However, these services often charge a fee of 10 percent or more to you. But today, blockchain applications in banking is changing the way money is sending around the world, at a lower fee. Bitcoin is such first use case. Companies like Ripple, tapping on this radical financial technology, change the way money is sent around the world for everyday customers.

3. Allow Fast Borrow & Lend Money:

Have you ever try to borrow money from a bank? Let's face it: The current lending industry is inefficient. Especially with lots of documents to fill up, and high-interest rate. P2P lending is rapidly growing in personal finance. Now, both borrowers and lenders are connected all over the world via blockchain. All without giving the bank their cut.

As lenders, you can remain completely anonymous and does not need to register anywhere. Just select your preferred loan from the marketplace. Next, initiate from your wallets. Borrowers can return the loan in a low-interest environment.

4. Increase High Uptime For Central Bank:

The use of a cashless system is growing. For example, credit card, Apple Pay or QR code payment. But, what happens when the system goes offline for a long period?

There's chaos.

The fact that bitcoin has been operating for a long time, and has not suffered even a nanosecond of downtime. As a result, increasing number of central banks are actively testing blockchain for a variety of usage. In particular, for its resiliency and transparency.

5. Reduce Insurance Fraud:

Insurance can be exposed to numerous fraud schemes. For example, a new applicant can commit fraud by withholding critical information. Or, by filing a claim on behalf of ineligible dependents.

So what can we do to reduce insurance fraud? Well, record medical procedures and time stamp via blockchain platform. This helps compliance and verification of medical services rendered. Together with IBM and Catena Technologies, fifteen Indian insurers tied up to create this blockchain based solution.

CONCLUSION:

Blockchain is used due to its various features. There are various applications of blockchain technology in several industries, where the trust without the involvement of a centralized authority is desired. So welcome to the world of Blockchain

REFERENCES:

1. Murat Kuzlu, Manisa Pipattanasomporn, Levent Gurses, "Performance Analysis of a Hyperledger Fabric Blockchain Framework: Throughput, Latency and Scalability", IEEE International Conference on Blockchain (Blockchain), 2019, 536-540
2. Suisheng Li, Hong Xiao, Hao Wang, Tao Wang, Jingwei Qiao, Shaofeng Liu, "Blockchain Dividing Based on Node Community Clustering in Intelligent Manufacturing CPS", IEEE International Conference on Blockchain (Blockchain), 2019, 124-131
3. Xinle Yang, Yang Chen, Xiaohu Chen, "Effective scheme against 51% Attack on Proof-of-Work Blockchain with History Weighted Information", IEEE International Conference on Blockchain (Blockchain), 2019, 261-265
4. Shu Yang, Ziteng Chen, Laizhong Cui, Mingwei Xu, Zhongxing Ming, Ke Xu, "CoDAG: An efficient and compacted DAG-based blockchain protocol", IEEE International Conference on Blockchain (Blockchain), 2019, 314-318
5. Tara Salman, Raj Jain, Lav Gupta "A Reputation Management Framework For Knowledge-Based And Probabilistic Blockchain", IEEE International Conference on

Blockchain (Blockchain) 2019, 520-527

6. AlemFitwi, Yu Chen, Sencun Zhu, "A Lightweight Blockchain-based Privacy Protection for Smart Surveillance at the Edge", IEEE International Conference on Blockchain (Blockchain), 2019, 552-555
7. Mohammad Javad Amiri, Divyakant Agrawal, Amr El Abbadi, "On Sharding Permissioned Blockchains", IEEE International Conference on Blockchain (Blockchain), 2019, 282-285
8. Sachin Shetty, Amanda Davenport, "Air Gapped Wallet Schemes and Private Key Leakage in Permissioned Blockchain Platforms", IEEE International Conference on Blockchain (Blockchain) 2019, 541-545
9. Gero Dittmann, Jens Jelitto "A Blockchain Proxy for Lightweight IoT Devices", Crypto Valley Conference on Blockchain Technology (CVCBT), 2019, 82-85
10. Hyojung Lee, Kiwoon Sung, Kyusang Lee, Jaeseok Lee, Seungjai Min "Economic Analysis of Blockchain Technology on Digital Platform Market", IEEE 23rd Pacific Rim International Symposium on Dependable Computing (PRDC), 2019, 94-103
11. Junjun Lou, Qichao Zhang, Zhuyun Qi, Kai Lei "A Blockchain-based key Management Scheme for Named Data Networking", IEEE International Conference on Hot Information-Centric Networking (HotICN 2018), 2018, 141-146
12. <https://www.javatpoint.com/>